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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER
MALKOWSKI, KENNETH J

ART UNIT	PAPER NUMBER
2613	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/668,818	RICE ET AL.	
	Examiner	Art Unit	
	Kenneth J. Malkowski	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 March 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2002/0105704 to Numata et al. in view of U.S. Patent No. 6,751,388 to Siegman et al. and further in view of U.S. Patent No. 6,757,499 to Aoki et al.

With respect to claims 21-22 and 26-28, Numata discloses a system for transmitting data (optical transmission system, title) by preferentially launching input power (111, Figure 1 (labeled light emission element)) into a large core multimode fiber optic cable (LCMFOC) to increase a length/data rate product of the LCMFOC (12, Figure 1)(page 1 paragraph 10), the system comprising: a light source for transmitting data from a source as a first light signal (111, Figure 1 (labeled light emission element)), wherein the first light signal comprises a sequence of short light pulses (pages 2-3 paragraph 37); a lens (112, Figure 1) having a focal length (f), placed in a path of said first light signal at a distance of approximately said focal length (f) from an end of said LCMFOC (Z1, Figure 2)(abstract, vertex of lens 112 and an input plane of the multi-mode fiber), wherein the lens (112, Figure 1) is located to receive said first light signal from said light source (111, Figure 1 (light emission element)) and to collimate and focus said short light pulses (Figure 2 shows the narrowing of light after lens 112) onto the end of the LCMFOC (Fin, Figure 2) such that a diameter of focused short light pulses is approximately

equal to a core diameter of the LCMFOC to excite low fiber modes and minimize excitation of higher order fiber modes in the LCMFOC (Figure 2 light from lens 112 is shown entering the exposed core of multimode fiber optic cable 12 wherein the diameter of the light is approximately equal to the core, give or take a margin of error))(page 4 paragraph (light diameter in relationship to the core diameter can be oriented to control dispersion and transmission distance))(page 4 paragraph 55 (NA s is equal to or less than NA f)) (page 4 paragraph 51 (the diameter of the entering light and of the core of the fiber effect how the transmission data propagates down the fiber and therefore attenuation of higher order modes)), wherein the LCMFOC is designed to decrease higher order fiber modes which increase pulse spreading that limit the length/data rate product and to thereby increase a transmission distance through the LCMFOC and output second light pulses which include substantially only lower order fiber modes (page 4 paragraph 51 (the diameter of the entering light and of the core of the fiber effect how the transmission data propagates down the fiber and therefore attenuation of higher order modes))(Figure 9 depicts the difference between how high and low order modes propagate down a fiber)), wherein the LCMFOC comprises: an exposed core having the core diameter which receives the focused short light pulses (Figure 2 displays the shaded region in fiber 12 as the core which is exposed to light source 111, wherein any core inherently has a diameter as shown).

However, Numata fails to disclose including a step of using a step index fiber optic cable having a doped cladding layer for absorptive attenuation of higher order modes. Seigman, from the same field of endeavor discloses a step of using a step index fiber optic cable having a doped cladding layer for absorptive attenuation of higher order modes (column 1 lines 36-47 (step index exists between the core and cladding regions such that the result is no higher-order modes

are able to propagate or be trapped by the fiber))(column 3 lines 47-58 (fiber has a core, cladding and a doping profile distributed between said core and cladding to create a doping profile which defines the gain properties of modes))(column 11 lines 50-54 (well known principles dictate the result of doping the cladding layer)). Therefore, it would have been obvious to one of ordinary skill in the art to implement the doped cladding layer to reduce higher order modes as taught by Seigman in the fiber optic cable as taught by Numata. The motivation for doing so would have been to reduce the amount of mode mixing and randomization of propagating modes to reduce dispersion (Seigman: column 7 lines 1-15).

Furthermore, Numata in view of Seigman fail to specifically disclose wherein said light source transmits data at greater than 10 gigabits per second. Aoki, from the same field of endeavor teaches an optical transmitter and optical signal transmitter (title) and also discloses that in a patent filed in 2000 that the standard long distance fiber-optic transmission speed is between 2.5 and 10 Gb/s (column 1 lines 45-50). The motivation for including a transmitter that can transmit at greater than 10 gigabits per second would be for the obvious advantage of receiving information faster than if data were transmitted at below 10 gigabits per second.

Claims 23 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2002/0105704 to Numata et al. in view of U.S. Patent No. 6,751,388 to Siegman et al. and further in view of U.S. Patent No. 6,757,499 to Aoki et al. and further in view of U.S. Patent No. 6,724, 956 to Edvold et al.

With respect to claims 23 and 29, Numata in view of Seigman and further in view of Aoki disclose the system as recited in claim 21, however, fail to specifically disclose wherein said light source provides light having a wavelength greater than 750 nanometers. The invention

disclosed by Edvold, from the same field of endeavor, teaches that the industry standard for transmitting on fiber is 1550 nm and typically operate in the 1530 to 1565 nm range (column 1 lines 28-44). The motivation for transmitting a wavelength at greater than 750 nanometers is because of its favorable signal loss and dispersive properties (Edvold column 1 lines 27-44).

With respect to claim 25, Numata in view of Siegman and further in view of Aoki disclose the system for high speed data transmission as recited in claim 21 further including a receiver coupled to an opposing end of said large core multimode fiber optic cable for receiving said transmitted data (Numata: 22, Figure 7).

3. Claims 24 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2002/0105704 to Numata et al. in view of U.S. Patent No. 6,751,388 to Siegman et al. and further in view of U.S. Patent No. 6,757,499 to Aoki et al. and further in view of U.S. Patent No. 6,476,951 to White et al.

With respect to claims 24 and 30, Numata in view of Siegman and further in view of Aoki disclose the system for high-speed data transmission as recited in claim 21, however, does not specifically mention a launching power. Despite this transmission power being launched at 20 dBM or greater is well known in the art and does not constitute a patentably distinct limitation. White from the same field of endeavor discloses a signal level from said light source is launched to said large core (abstract (50-62.5 microns)) multimode fiber optic cable (abstract (multimode optical fiber)) at greater than 20 dBM (column 7 lines 10-19 (transmitters are configured to transmit signals at a launch power level up to 20dB greater than required by typical communication protocols)). Therefore, it would have been obvious to one of ordinary skill in the art to transmit at a launch power level of 20 dbM or greater as is taught by White. The

motivation for doing so would have been to compensate for high amounts of fiber attenuation (column 6 lines 46-56).

Response to Arguments

4. Applicant's arguments with respect to claims 21-30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J. Malkowski whose telephone number is (571) 272-5505. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KJM 4/26/07

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER